S.Q. TUBE

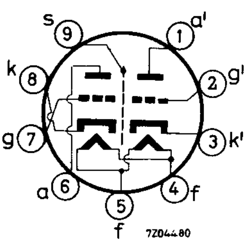
Special quality double triode designed for use in cascode circuits and as R.F. or I.F. amplifier.

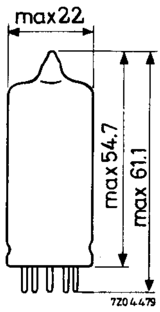
QUICK REFERENCE DATA			
Life test	10 000 hours		
Low interface resistance			
Mechanical quality	Shock and vibration resistant		
Base	Noval. Gold plated pins		
Heating	Indirect A.C. or D.C.; parallel supply		
Heater voltage	V_f	6.3	V
Heater current	I_f	475	mA
Anode current	I_a	30	mA
Mutual conductance	S	20	mA/V
Equivalent noise resistance (R.F.)	R_{eq}	200	Ω
Noise figure	F	5.7	dB

DIMENSIONS AND CONNECTIONS

Dimensions in mm

Base: Noval





CHARACTERISTICS

Column I Nominal value or setting of the tube
II Range values for equipment design: Initial spread
III Range values for equipment design: End of life

		I	II	III	
Heater voltage	V_f	6.3			V
Heater current	I_f	475	450 - 500		mA
Anode supply voltage	V_{ba}	100			V
Grid supply voltage	$+V_{bg}$	9			V
Cathode resistor	R_k	350			Ω
Anode current	I_a	30	28 - 32	min. 26.5	mA
Mutual conductance	S	20	17 - 22.5	min. 14.5	mA/V
Amplification factor	μ	25			
Internal resistance	R_i	1.25			kΩ
Equivalent noise resistance	R_{eq}	200			Ω
Noise figure in cascode circuit	F	5.7			dB
Adapted to minimum noise					
Negative grid current	$-I_g$		max. 0.2	max. 1	µA
Anode supply voltage	V_{ba}	60			V
Cathode resistor	R_k	80			Ω
Anode current	I_a	1.5			mA
Mutual conductance	S	15.5			mA/V
Amplification factor	μ	25			
Internal resistance	R_i	1.85			kΩ
Noise figure in cascode circuit	F	5			dB
Adapted to minimum noise					

CAPACITANCES Each system if applicable

Grid to cathode heater and screen	$C_{g/kfs}$	4.7	pF
Anode to cathode heater and screen	$C_{a/kfs}$	1.9	pF
	$C_{a'/k'fs}$	1.8	pF
Anode to grid	C_{ag}	1.8	pF
Cathode to grid heater and screen	$C_{k/gfs}$	7.8	pF
Anode to grid heater and screen	$C_{a/gfs}$	3.5	pF
	$C_{a'/gfs}$	3.4	pF
Anode to cathode	C_{ak}	0.25	pF
Anode to anode other section	$C_{aa'}$	max. 0.05	pF
Grid to grid other section	$C_{gg'}$	max. 0.005	pF

SHOCK AND VIBRATION RESISTANCE

The following test conditions are applied to assess the mechanical quality of the tube. These conditions are not intended to be used as normal operating conditions.

Shock

The tube is subjected 5 times in each of 4 positions to an acceleration of 500 g supplied by an NRL shock machine with the hammer lifted over an angle of 30°.

Vibration

The tube is subjected during 32 hours in each of 3 positions to a vibration frequency of 50 Hz with an acceleration of 2.5 g.

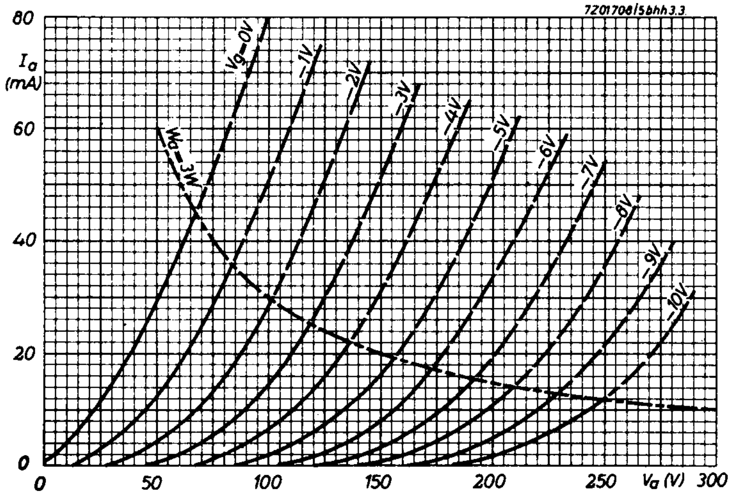
LIFE

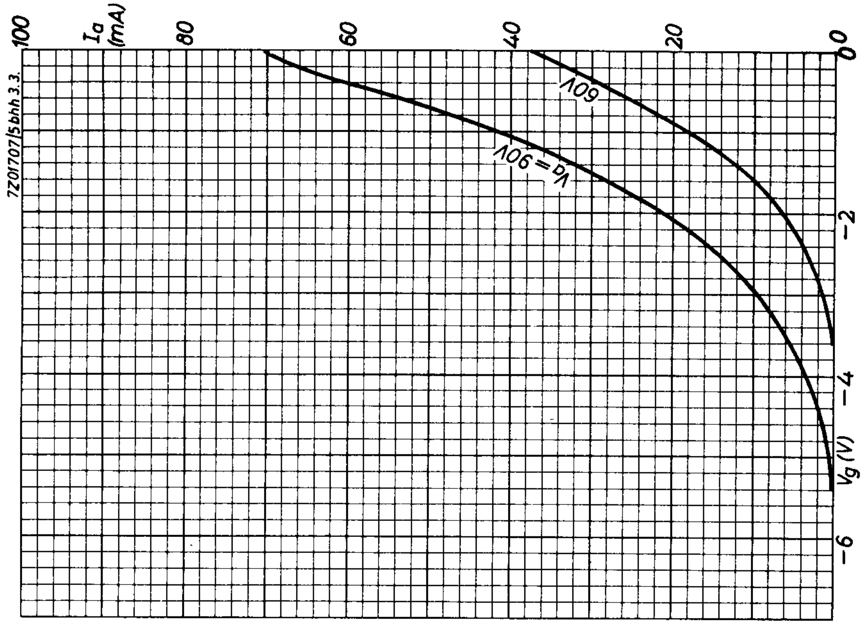
Production samples are tested during 10 000 hours.

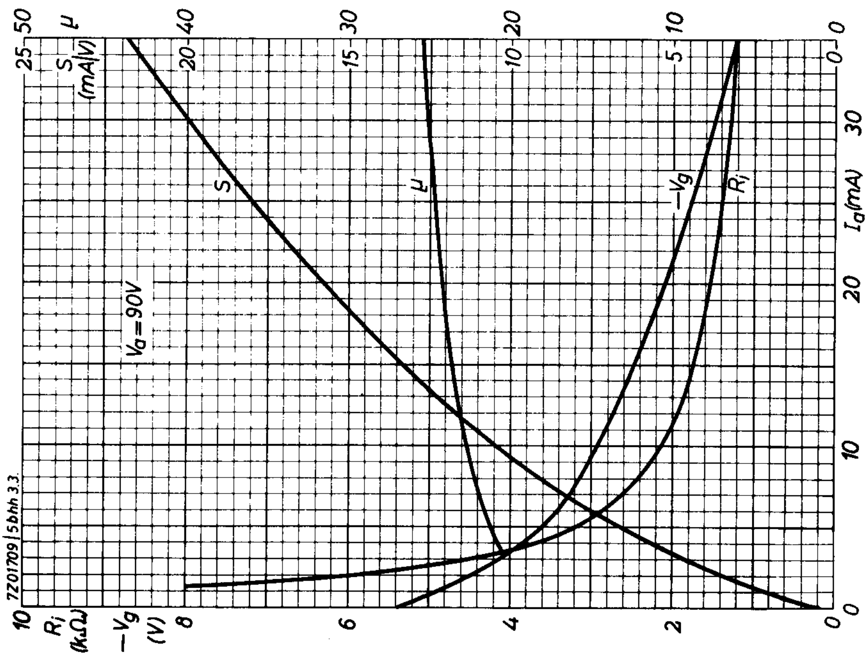
LIMITING VALUES (Absolute max. rating system)

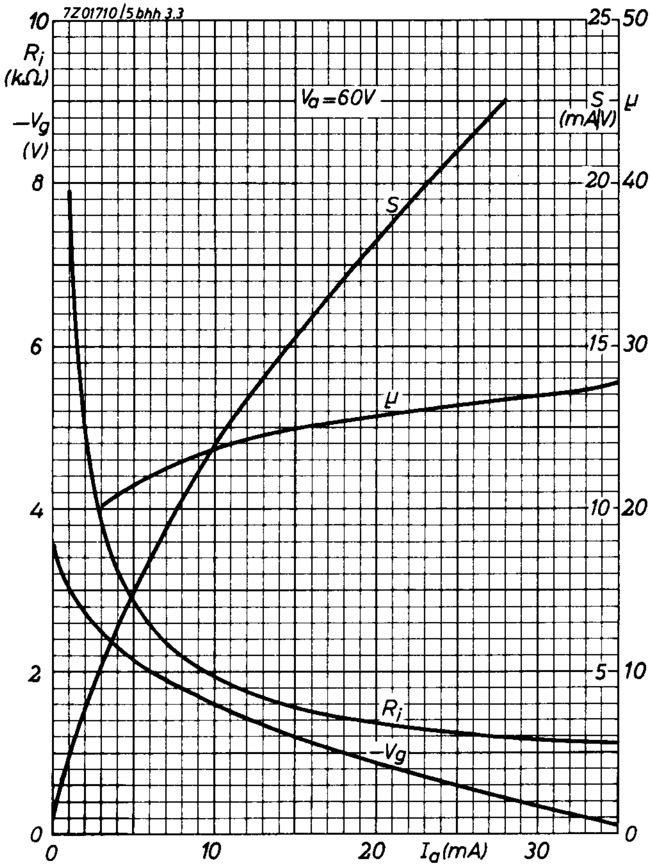
Anode voltage	V_{a_o}	max. 400	V
	V_a	max. 250	V
Anode dissipation	W_a	max. 3	W
Grid voltage	$-V_g$	max. 50	V
Grid peak voltage	$-V_{g_p}$	max. 150	V
Max. pulse duration 10 μsec			
Max. duty factor 0.01			
Grid resistor with automatic bias	R_g	max. 1	MΩ
Cathode current	I_k	max. 40	mA
Cathode peak current	I_{kp}	max. 400	mA
Max. pulse duration 10 μsec			
Max. duty factor 0.01			
Voltage between cathode and heater	V_{kf}	max. 150	V
Bulb temperature	t_{bulb}	max. 190	°C

Heater voltage: The average heater voltage should be 6.3 V. Variations of the heater voltage exceeding the range of 6.0 V to 6.6 V will shorten the tube life. The tolerance of heater current (column II) should be taken into account.




7Z01707|5bhh 3.3.
I_a (mA)
100
80
60
40
20
0
0
−2
−4
−6
V_g (V)
$V_a = 90V$
60V


7Z01709|5bhh 3.3.
μ
50
40
30
20
10
0
S (mA/V)
25
20
15
10
5
0
R_i (kΩ)
10
$-V_g$ (V)
8
6
4
2
0
0
10
20
30
I_a (mA)
$V_a = 90V$
S
μ
$-V_g$
R_i


7Z01710/5 bhh 3.3
10
R_i
(kΩ)
$-V_g$
(V)
8
6
4
2
0
0
10
20
I_a(mA)
30
V_a=60V
S
μ
R_i
$-V_g$
25
50
S
μ
(mA/V)
20
40
15
30
10
20
5
10
0

PHILIPS

Data handbook

Electronic components and materials

E288CC

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